8.40 PBS SR-0040 Nuclear Facility Deactivation and Decommissioning

8.40.1 Background

After 40 years of producing nuclear materials for defense and non-defense uses, the SRS shifted its strategic direction and resources from nuclear materials production to cleanup. An integral part of the cleanup mission is decommissioning of facilities constructed in support of nuclear materials production as well as those facilities constructed in support of cleanup. This includes 1,013 major facilities that are to be decommissioned as part of the EM cleanup project.

The *2002 PMP* included only the decommissioning of 72 buildings with deactivation and long-term stewardship assumed for the remaining buildings. This *PMP* includes decommissioning of all major EM facilities, including planned new EM facilities such as Glass Waste Storage Building 2, Canister Shipping Facility, and Salt Waste Processing Facility. This project also includes surveillance and maintenance of the decommissioned facilities through FY 2025. In FY 2026, upon completion of the EM mission at SRS, the responsibility for surveillance and maintenance will transfer to another DOE program office.

An end state is the status of a facility or waste site after decommissioning and closure activities are complete. The selection of end states is very important to the planning process because it dictates the required extent of facility decommissioning and site remediation, and also factors heavily into the cost, schedule, and work scope of the decommissioning project.

The vision for SRS is that operations will be concentrated toward the center of the site to form a central core area with continuing non-EM missions. It is envisioned that this central core area will be surrounded by a buffer area, which will provide a safety and security zone between the central core area and the public.

There are two possible decommissioning end state alternatives for SRS facilities: demolition and in-situ disposal (ISD). For each facility, the end state is determined by considering:

- Physical condition at the time of decommissioning
- Structural factors affecting difficulty of removal or effectiveness of containment
- Proximity to public access areas, or surface or groundwater sources
- Stakeholder expectations
- Extent of contamination and/or hazardous material and the degree to which they may pose a threat to the environment or the public.

Preliminary end states have been identified for all the major facilities. All excess EM facilities within the buffer area will be demolished. A graded approach to the decommissioning process assures the appropriate stakeholder, Environmental Protection Agency (EPA) and South Carolina Department of Health and Environmental Control (SCDHEC) involvement in decommissioning end state decisions.

Note: The grouting of 51 high-level waste tanks (which are part of the 1,013 major facilities) are covered in PBS SR-0014C, Radioactive Liquid Tank Waste Stabilization and Disposition. The decommissioning of the infrastructure surrounding the tanks is included in this PBS.

Table 8.40.1 illustrates the breakout of the preliminary end states for all of the facilities and shows a status as of February 2004.

Table 8.40.1, SRS Facility Endstates

Units	Demoliton	In-Situ Disposal	Total	Demolished	End State Attained	To Go
Facilities	857	105	962	58	0	904
F&H Area Tanks*	0	51	51	NA	2	49
Total	**1013**		**1013**	**58**	**2**	

* These tanks are covered under PBS SR-014C

8.40.2 End State

The EM cleanup project is scheduled for completion by FY 2025, at which time EM will have completed its mission at SRS and will not require the use of any facilities. All 1,013 major facilities, their ancillary structures, and planned new EM facilities will be decommissioned.

8.40.3 Scope and Description

This PBS funds decommissioning of all SRS EM facilities (except F and H HLW tanks). To ensure consistency and clarity in planning, documentation, and reporting, a controlled listing of SRS facilities for decommissioning, referred to as the Comprehensive Facility List (CFL) is maintained. Facilities on this list are included in the Savannah River Site Environmental Management Integrated Deactivation and Decommissioning Plan and will be used for planning, tracking, and reporting progress in EM cleanup to DOE.

The Decommissioning Project will work closely with the Soil and Groundwater Project to appropriately sequence and execute decommissioning projects to complete and close specific SRS areas.

8.40.4 Responsibilities

In addition to the overall responsibilities identified in Section 4.3, PBS specific responsibilities are summarized as follows.

This PBS falls under the responsibility of the DOE-SR Assistant Manager for Closure Project. In accordance with DOE Order 413.3, Program and Project Management for the Acquisition of Capital Assets, a Federal Project Director has been identified to manage this PBS and will be approved by EM-1. The Federal Project Director uses an Integrated Project Team (IPT) approach to manage the PBS. The IPTs are comprised of personnel from a wide variety of disciplines to ensure the work is managed safely and effectively.

The performance of the work scope for this PBS is the responsibility of the management and operations contractor. Currently, the contractor is the Westinghouse Savannah River Company (WSRC). Within WSRC, the responsibility for this work scope resides with the Closure Business Unit Manager. The Project Manager is the Director of Site D&D.

8.40.5 Schedule

Decommissioning for the major facilities will be completed as follows:
F Area, except for Central Laboratories, Building 717-F
and Building 235-F – FY 2014
Building 235-F – FY 2020
F Tank Farm – FY 2021
H Canyon – FY 2020
H Tank Farm – FY 2025
K Area – FY 2025
L Area – FY 2025
M Area – FY 2006
P Area – FY 2010
C Area – FY 2014
R Area – FY 2010
S Area – FY 2025
T Area – FY 2004
Z Area – FY 2025
A Area – FY 2025
D Area Heavy Water associated facilities – FY 2006
D Area powerhouse buildings – FY 2023 .

8.40.6 Resources

The cost profile for this PBS is TBD

The ROM model was used to generate the base estimate for each facility and then factors were added to account for items such as waste disposition, ancillary structures, and process or personnel relocations. This model was used in the previous estimate as well and has been validated by both internal and external organizations. The ROM model will be revalidated based on actual SRS decommissioning cost data.

The previous lifecycle estimate and the *2002 PMP* assumed that the facilities other than those in T, D, and M areas would be deactivated and maintained in long-term stewardship. There was no decommissioning scope or costs included in the *2002 PMP* for any other facilities. In addition, decommissioning costs for new facilities were not included in the *2002 PMP* e.g., GWSB II, SWPF, and Canister Shipping Facility.

Government Furnished Services and Items
The following Government Furnished Services and Items have been identified:

§ DOE will work with the contractor and the South Carolina Historic Preservation Office to obtain an agreement that defines the Historical Preservation requirements such that the contract baseline D&D schedules are not impacted.

Technology Needs

Better waste characterization technologies are needed to support this project. In addition to the aforementioned resource requirements, the following technology needs have been identified in support of accelerated cleanup:

§ Improvements are needed in waste characterization and waste stream segregation technologies to quickly assay materials to improve the overall efficiency of deactivation and decommissioning activities.
Benefit: Reduces costs to segregation, characterization and disposal
Development timeframe: FY 2005

§ Better characterization technologies are needed that can quickly and conclusively determine the type of contamination (tritium, radium, etc.), the cross-sectional profile of the volumetric contamination, and the amount of contamination in various materials.
Benefit: Reduces characterization and disposal costs
Development timeframe: FY 2005

§ Development of a technology to allow the aerosol application of a benign agent within a radioactively contaminated area that would "fix" loose and airborne contaminants (especially alpha emitting products).
Benefit: Reduces personnel exposure and environmental impact
Development timeframe: FY 2008

§ Technologies are needed to remove and disposition Cs^{137}, Sr^{90} and tritium from large volumes of contaminated water in the reactor basins at SRS.
Benefit: Reduces environmental impact and surveillance costs
Development timeframe: FY 2010

§ Provide risk assessments for deactivation and decommissioning closures.
Benefit: Ensure closed facilities are protective of the environment under appropriate risk scenarios
Development timeframe: FY 2004 – FY 2006

§ Pursue Technology Alternatives Project, Alternatives for Environmental Assessment at SRS, to develop an interactive, multi-media model that allows decision-makers to quickly assess the impact of various non-baseline alternatives by evaluating contaminant release and transport for assessment of environmental pathways and receptors related to individual actions, as well as the collective impact of multiple actions, on risk and/or cost reductions.
Benefit: Reduce cost and improve schedule through integrated decision making; provide non-baseline alternatives for risk prioritization; holistically integrate multi-scale environmental data
Development timeframe: FY 2005 – FY 2006

§ Provide performance assessment baseline for disposal of new deactivation and decommissioning wastes at E Area.
Benefit: Allows cost effective and timely disposal of D&D wastes
Development timeframe: FY 2004 – FY 2005

8.40.7 Key Assumptions, Agreements, Alternatives, Trade-offs, and Risk Management

Key Assumptions

The following key assumptions have been used as the basis for the lifecycle cost and schedule development:

- The site boundaries will remain unchanged, and the land will remain under the ownership of the federal government with institutional controls being in place. Land use will be non-residential
- An integrated D&D and Soil and Groundwater cleanup approach will be implemented. The approach will be consistent with the Integrated D&D Plan and the Risk Based End State Vision (currently being prepared) with the following exceptions:
  - Any changes to facility readiness for decommissioning defined during schedule development of other PBSs will be incorporated.
  - All 1,013 major facilities currently identified and all associated ancillary facilities and structures will be decommissioned, as well as all new planned EM facilities (e.g., Treatment and Storage Facility, Canister Shipment Facility, Glass Waste Storage Building # 2, Salt Waste Processing Facility).
- Decommissioning will be integrated with soils and groundwater closure activities and contamination in the foundations will be removed to a level that does not create an additional waste unit
- SRS will have access to onsite and offsite locations and repositories in which nuclear, radioactive, and hazardous wastes can be treated and disposed
- Treatment and Storage Facility (TSF) will be built within the 105-L building structure and decommissioning of the 105-L facility will include TSF
- Deactivation costs for the primary operating facilities are included in the parent PBS for a given facility
- Deactivation of site general area administrative type facilities is included within this PBS
- Funding for post-decommissioning surveillance and maintenance through 2025 is included in this PBS.

Agreements

The following agreement is a driver for this project:

- DOE-SR/SC-DHEC/US-EPA *Memorandum of Agreement for Achieving an Accelerated Cleanup Vision Savannah River Site.*

Alternatives, Trade-offs, and Risk Management

The following risks in achieving the PBS objectives have been identified:

- Integration of operations, deactivation, decommissioning and area closure activities must be successful to meet the FY 2025 EM site completion date for certain facilities
- Identification and remediation of newly discovered environmental releases associated with facilities could impact the overall cleanup cost and schedule for area closure. (Areas under slabs)

8.40.8 Performance Monitoring and Evaluation

8.40.8.1 HQ Monitoring and Evaluation

Monitoring of this PBS at the HQ level is completed primarily through use of the Integrated Planning, Accountability, and Budget System (IPABS) system. Actual cost, schedule, and performance data are collected for each PBS and compared to the established baseline. All elements of the lifecycle baseline are under EM-HQ configuration control. Performance data include the Gold Metrics and the Budget Milestones. Progress toward these measures and any proposed changes to them are provided as follows.

Gold Metrics

Table 8.40.2 Facilities Decommissioning Gold Metrics

	Industrial		Nuclear		Radiological	
	Current	Proposed	Current	Proposed	Current	Proposed
FY03	21	22	2	2	0	0
FY04	18	52	1	3	0	1
FY05	19	14	0	4	1	0
FY06	25	103	1	8	2	4
FY07	93	16	5	3	1	1
FY08	13	4	1	1	0	0
FY09	3	1	0	0	1	0
FY10	1	11	15	2	1	1
FY11	0	0	4	0	0	0
FY12	0	37	7	1	0	0
FY13	0	30	7	4	0	2
FY14	0	17	6	4	0	4
FY15	0	25	4	4	0	0
FY16	4	5	9	1	0	0
FY17	4	7	7	11	3	0
FY18	22	46	9	10	4	2
FY19	11	120	15	12	3	2
FY20	2	35	8	14	2	5
FY21	3	10	10	22	4	2
FY22	30	93	26	14	4	3
FY23	164	49	28	12	5	3
FY24	236	41	17	16	7	8
FY25	111	42	12	49	1	1
Subtotals	**780**	**780**	**194**	**197**	**39**	**39**

Basis for change: Previous baseline (DOE Baseline Change Proposal *EM Corporate Performance Metrics–Gold Chart – Modifications of Nuclear, Radioactive and Industrial Facilities–Life Cycle Metrics, dated 3/16/2004*) includes decommissioning of 1,013 major facilities, including F, H, and S canyons. The proposed metric includes the 1,013 facilities plus and the three proposed new facilities - CSF, GWSB

II, and SWPF. The annual distribution listed above is based upon Rev. 1 of the *Savannah River Site Environmental Management Integrated Deactivation and Decommissioning Plan.* The funding profiles schedules reflect the current facility availability based upon best available knowledge. It is expected that the metrics will be updated on a routine basis to reflect operational changes at SRS. It also takes into account when the facilities are currently scheduled to be available.

Budget Milestones

Name	Original	Completion	Actual	Forecast
Decommissioned and demolished 21 industrial facilities.	09/30/2003	09/30/2003	09/30/2003	
Completed the evaporation of 0.5 million gallons of basin water	09/30/2003	09/30/2003	01/192004	
Issued Rev. 1 of the Savannah River Site Integrated Decontamination and Decommissioning Plan in April 2003. This plan defines the end states and appropriate disposition activities for all the Savannah River Site facilities (both operating and excess), and drives the priority and schedule for decommissioning activities for the 1013 Gold Metric facilities at the Savannah River Site	09/30/2003	09/30/2003	09/30/2003	
Stabilize (grout) the R-Reactor Basin in order to prevent contaminated basin water from leaking into the groundwater in R Area	09/30/2006	09/30/2006		9/30/2006
Complete decommissioning of • 18 Industrial facilities • 1 Nuclear facility	09/30/2004	09/30/2004		9/30/2004
Complete decommissioning of: • 37 Industrial, • 1 Nuclear, and • 1 Radiological facility from Oct. 2003 through Sept. 2005.	09/30/2005	09/30/2005		9/30/2005
Complete decommissioning of: • 62 Industrial, • 2 Nuclear, and • 3 Radiological facility from Oct. 2003 through Sept. 2006.	9/30/2006	9/30/2006		9/30/2006

Basis for change: Budget milestones updated to reflect scope acceleration of Contract Modification M100.

8.40.8.2 Site Monitoring and Evaluation

Refer to Section 4.3 for a description of the site's performance monitoring and evaluation process.